Event Calendar for Community Broadband Network

Fourth-year undergraduate project in Group F, 2003/2004

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Technical abstract

Community broadband networks can provide fast, "always on" Internet access to homes in villages where other broadband services, such as ADSL, are not economically viable. This makes a range of Internet-based community applications technically feasible.

The aim of this project was to research, specify, design, implement and test a web-based event calendar for use on a community broadband network in Bottisham, a village near Cambridge. The web site was required to store and publicise details of community events and allow users to keep track of their own, personal appointments.

A major motivation behind the development of the web site was to prevent its users from forgetting about important appointments and tasks. This was achieved through the provision of automated reminders via e-mail. Considerable time was spent researching the characteristics that make a reminder effective. It is believed that this research will set this software apart from many of its competitor products.

Since it was envisaged that many of the system's users would be computer novices, ease of use was an important requirement. The software process involved prototyping of key aspects of the interface, evolutionary development and substantial acceptance testing. At each stage, feedback was sought from users of varying levels of computer literacy. This was combined with research and brainstorming to iteratively improve the design. An on-line user manual has also been built into the system.

Security is a serious consideration for web applications. The community calendar has unusual security requirements because its users will probably know one another in person, whereas most Internet communities have fairly anonymous and geographically diverse users. The need for moderation is less, but perhaps the risk of misuse of administrative powers to achieve censorship is greater. A community security model based on peer approval was developed to reflect this.

Events added to the community calendar are categorised by means of "interest groups", which are groups of users with a common interest. These allow users to find information they are interested in without being bombarded with irrelevant material. Many of the system's security rules are based around membership of these groups.

The system was split into two strands for specification, design and development. The

underlying "engine", which is responsible for storage and manipulation of data, was tackled by the waterfall method of software engineering; the user interface was developed by the evolutionary method.

Repeating events is an extremely complicated subject, which was given considerable thought during the specification phase. It was necessary to reach a compromise between the range of repetition patterns possible and the complexity of the user interface. The chosen design balances flexibility with ease of use by allowing the user to apply several different, simple repetition patterns simultaneously.

A custom software solution satisfying the user requirements was implemented using server-side PHP scripts and a MySQL database. These were complemented by client-side scripts written in JavaScript, which enhance the web pages that form the user interface. After consideration of the differences between PHP4 and PHP5, the server-side code was written in PHP4 with an upgrade to PHP5 in mind. Attention was given to the production of maintainable code.

The system makes use of the object-oriented features of PHP to implement a modular architecture. It is possible for developers to add new functionality without modifying any of the existing code. New reminder mechanisms, such as SMS text messages, could be added in this way.

Because of the usability requirement, testing has been a major focus of this project. Three teams of volunteers were recruited to assist with the various stages of testing. Their bug reports and feature requests were used to iteratively improve the pre-release versions, both in terms of reliability and user interface functionality. During the course of testing, the system has been installed on servers running both Linux and Windows operating systems and its web pages have been successfully viewed with a variety of web browsers under different operating systems.

The project suffered a few setbacks. For instance, the village server was not fully set up by the time the first version of the calendar was ready for testing. When the server was available, it was found not to have an appropriate installation of PHP to run the calendar software. Fortunately, sufficient time had been planned to account for unforeseen difficulties and the project remained on schedule.

The community calendar system is now fully installed and in use in Bottisham, where it has been well received. The software is due to be released under public licence at the end of June 2004. The source code of a release candidate and accompanying technical documentation, including the full specification, will be made available from SourceForge under the project name "comendar".

http://sourceforge.net/projects/comendar/